Under the No Action Alternative, environmental resources have already been committed. DOE would continue to use the plutonium pit manufacturing capability of PF-4 located in TA-55 at LANL. The current rate of resource use would continue.

For all other alternatives, short-term use of resources would increase, generally proportional to the number of plutonium pits manufactured each year. Short-term commitments of resources include the land and materials needed to construct the facilities, the labor commitment, transportation and associated impacts. Workers, the public, and the environment would be exposed to small amounts of radioactive and hazardous materials over the short-term from operations, waste handling, and transportation. The long-term benefit is the remedy of the U.S. security concern that the lack of long-term pit production capability is a national security issue requiring timely resolution. Since 1989, DOE has been without the capability to produce plutonium pits, which results in a decrease in the safety and reliability of the U.S. nuclear weapons stockpile.

Regardless of which alternative and location is selected, air emissions associated with the proposed MPF would introduce small quantities of radiological and nonradiological pollutants to the air around Los Alamos Site, NTS, SRS, Pantex Site, or Carlsbad Site. Over the operating period, these emissions would result in cumulative exposures to the workers, the public, and the environment. However, emissions would be within air quality and radiation exposure standards at any of the proposed sites, at all proposed levels of production. There would be no significant residual environmental effects on long-term environmental viability.

The management and disposal of radioactive wastes, sanitary solid and liquid wastes, and small amounts of hazardous waste would require temporary commitment of resources for treatment and storage, and long-term commitment of land for the disposal of radioactive wastes.

Continued and increased employment, expenditures, and generated tax revenues would occur during the short-term benefiting local, regional, and state economies. These benefits would occur at any location selected for the MPF project. Long-term economic gain could result from local governments investing project-generated tax revenues into infrastructure and other services.

Upon the closure of the MPF facilities, and eventual return of DOE land to public use in the future, DOE could decontaminate and decommission the facilities and equipment, allowing for potential future reuse. All five proposed locations for the MPF are on currently dedicated DOE facilities handling nuclear materials and wastes. Therefore, no change in long-term land use is anticipated. The short-term resources to operate the MPF at any of the proposed sites would not affect the long-term productivity of the sites.

5.11 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable commitment of resources for each alternative involving the new proposed MPF would include the commitment of mineral, water and energy resources for construction. For all alternatives, including the No Action Alternative, mineral, chemical, energy resources, process gases, and water would all be irretrievably committed.

Energy expended would be in the form of fuel for equipment and vehicles, electricity for facility operations, and either coal or natural gas for steam generation used for heating. The electrical energy requirement represents a large increase in electrical energy demand at most of the proposed sites. Los Alamos Site, NTS, Pantex Site, and Carlsbad Site would require improvements in the electrical power capacity, thereby increasing the irreversible and irretrievable commitment of resources for electrical power system improvements and expansion. Only SRS would not require expansion of the electrical power system for the proposed MPF.

MPF operations would generate nonrecyclable waste streams, such as radiological and hazardous waste. Disposal of these waste streams would require irreversible and irretrievable commitment of land resources. However, certain materials and equipment used during operations of the proposed facilities could be recycled when the facilities are decontaminated and decommissioned.

Water at all sites would be obtained from onsite sources or local government suppliers. Water would be used for domestic uses and cooling towers. Approximately 12 percent of the annual water consumption would be returned to the local environment as wastewater. The remaining 88 percent would be released to the atmosphere through evaporation, which would eventually return to the ground, although not necessarily locally, in the form of precipitation.

Process gases and chemicals irreversibly and irretrievably committed are listed in Table 5.11–1. Process gases are provided for glovebox inert atmosphere (nitrogen and argon), component cleaning (carbon dioxide), leak testing (helium), process chemistry (hydrogen and oxygen) and analytical laboratory analyses (nitrogen, argon, carbon dioxide, helium, hydrogen, oxygen and propane). Process chemical consumption is based on using an aqueous process as the baseline to produce pure metal for foundry operations. (Use of a pyrochemical purification process would require less nitric acid, and use hydrochloric acid rather than hydrofluoric acid).

Chemical additives are also used for domestic water (bacteria and pH control) and cooling tower water makeup (bacteria and corrosion control). Additional chemicals used in operations include those consumed in nondestructive examination (radiography and dye-penetrant testing) and analytical support operations.

For the alternatives analyzed in this EIS, the No Action Alternative would have the least commitment of irretrievable and irreversible resources, and the permanent commitment of resources would increase with the increased production of plutonium pits regardless of location.

Table 5.11–1. Chemical Requirements for MPF Alternatives

Chemical	Production Rate		
	125 ppy	250 ppy	450 ppy
Gases			
Helium, ft^3	130	250	450
Hydrogen, ft^3	2.7	5.4	9.8
Oxygen, ft^3	265	530	960
Argon, 10^3 ft^3	290	540	920
Carbon Dioxide, 10^3 ft^3	440	890	1,600
Nitrogen, 10^6 ft^3	8	9	11
Propane, ft^3	450	890	1,600
Process Chemicals			
Sulfamic acid, kg	1,200	2,400	4,400
Aluminum Nitrate Nonohydrate, kg	43,000	86,000	155,000
Nitric acid[a], kg	42,000	84,000	150,000
Sodium nitrite, kg	150	300	520
Tributyl Phosphate, kg	20	45	80
N-paraffin, kg	40	80	150
Ascorbic acid, kg	700	1,400	2,500
Hydrofluoric acid, kg	2,200	4,500	8,000
Calcium metal, kg	750	1,500	2,750
Formic acid, kg	6,000	12,000	22,000
Potassium fluoride, kg	70	130	240
Sodium carbonate, kg	70	70	70
Hydroxylamine nitrate, kg	490	970	1,800
Hydrazine, kg	150	300	560
Sodium hydroxide, kg	11,500	23,000	41,400
Erbium oxide, kg	4.5	9.1	18.0
Trichloroethane, liters	190	280	380
Machine oil, liters	20	40	80
Bromobenzene, liters	110	190	280
Hydraulic fluid, liters	470	950	1,700

[a] Assumes no nitric acid recycle – preliminary material balance estimates indicate that as much of 50 percent of this total may be recovered for reuse in process operations.